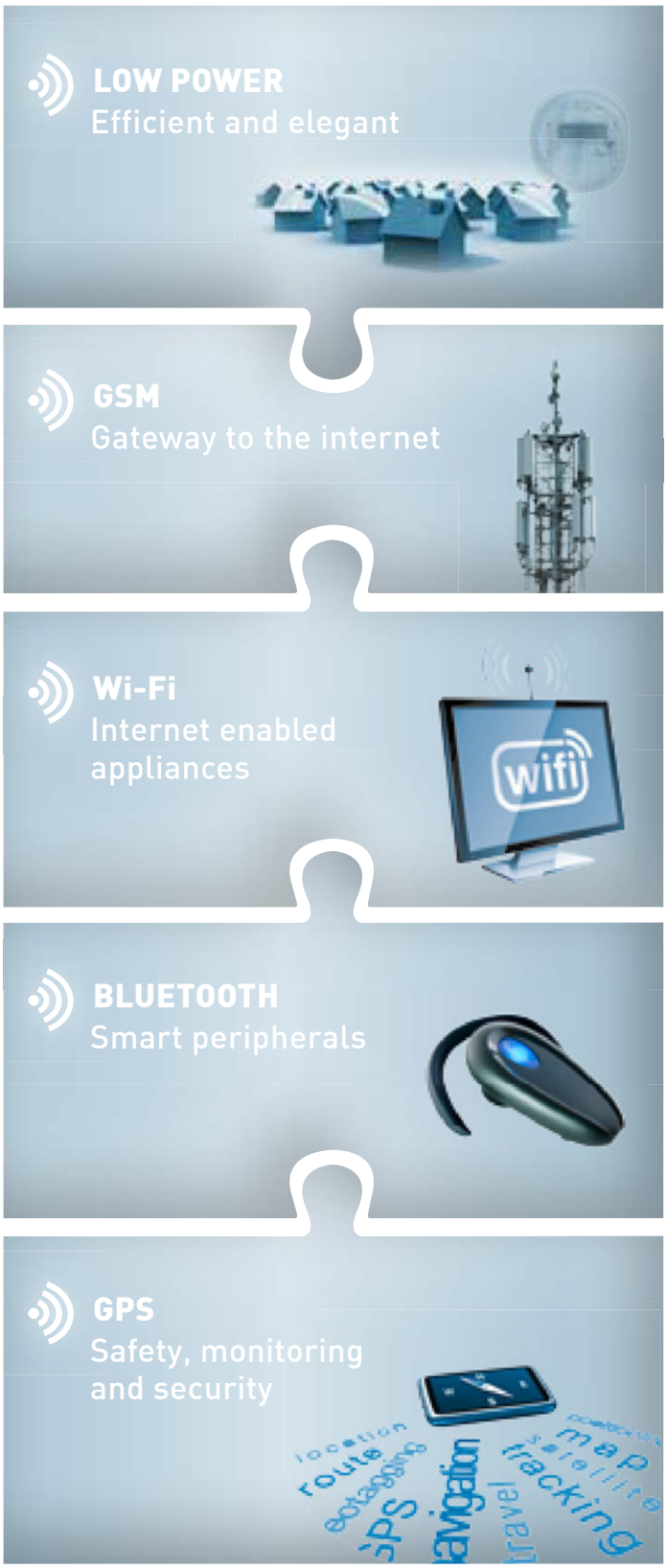
Avnet Embedded.
Embedding success in your business.

AVNET EMBEDDED WIRELESS & NETWORKING CAPABILITIES



WIRELESS & NETWORKING SOLUTIONS FROM AVNET EMBEDDED

As the Internet of things turns into a reality, wireless connectivity is fast becoming the defining feature of a modern device. But with the many different protocols, standards and subsequent approval requirements to consider, getting it right first time and on time needs a real depth of understanding and breadth of skill. As wireless product experts, Avnet Embedded can guide and advise to simplify the integration of wireless technologies into your hardware or help you to decide on a suitable Internet Gateway solution. We can even help with cloud based provisioning options that allow your hardware to be something today and something else tomorrow.

All of our Gateway solutions and most of our Wireless modules are pre-certified and approved, requiring only the same integration and certification as you would perform with any other electronic component. Complex protocols and stacks are included on the modules, removing the need to implement protocols such as TCP/IP in the host processor. More advanced modules can remove the requirement for a host processor, some including the latest Embedded Java ™ Virtual machine, others easy to use AT commands or procedure based scripting engines.

Avnet Embedded also offers a range of system-level components for high end architectures where a full RTOS, incorporating some level of driver support, is available. Usually these designs connect via PCIe, but if this is not available alternatives of board to board and surface mount device options are available for every technology. Whatever your host processor, be it the most basic PIC microcontroller through to the latest Intel powerhouse, we have connectivity solutions for you. Our applications staff are experienced in the implementation of all modules and with example setups and demonstrations ready to show you, making the integration even easier and faster, you're sure to deliver your project to time and specification.

Contact us on **wireless@avnet-embedded.eu** to find out more.

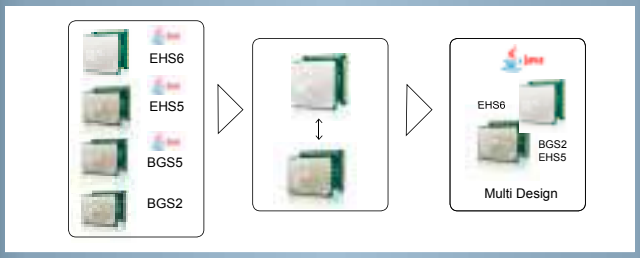
GSM/GPRS/EDGE/3G

As the cellular market continues to evolve, Avnet Embedded provides a forward-looking portfolio to ensure that customers have access to the latest products and technologies available. The Avnet Embedded product range includes full and half size PCI Express mini cards, small form factor LGA and connectorised 2G and 3G industrial and automotive modules, as well as 3G routers for demanding industrial applications and feature-rich environments.

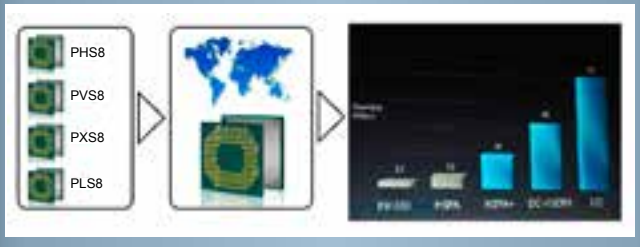
Gemalto is a global leader in cellular machine-to-machine communications with a track record of delivering innovative, fully type-approved modules and terminals to the market. By using the latest generation of chip technology, customers benefit from the highest performance available, achieving efficient lower power designs with long-term availability of supply guaranteed.

SCALABLE SOLUTIONS

Creating a scalable, cost efficient 2G to 3G platform without hardware re-design used to be difficult, but how about global roaming? One design, four product families and six different product combinations.By virtue of Gemalto's new LGA footprint integrators can now transition their design from the popular BGS2 GPRS modem to the BGS5 with Java, removing the need for external host processors and then upward to the EHS5 with Java, the smallest industrial 3G modem in the world and beyond to the Penta-band EHS6 with Java for true global roaming.

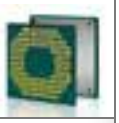


With ever growing demands for cutting edge technology Gemalto have created an advanced family form-factor providing seamless migration from the high speed HSPA+, with the globally approved PHS8, to EV-DO and HSPA+ multimode with the PXS8 and right into world of hyper-fast mobile broadband and the very latest DC-HSPA+ and LTE technologies with the PLS8. All with onboard GPS and Glonass.



Gemalto and Avnet Embedded: making the difficult easy and affordable.

Product family	2G - 3G Migration + Java™						
Product	BGS2	BGS5	EHS5	AGS2	EHS6	BGS2 mPCIe	EHS5 mPCIe
	GPRS	GPRS	HSPA	Automotive	HSPA	GPRS	HSPA
DB: dual band QB: quad band PB: penta band	QB (BGS2-W) DB (BGS2-E) GSM/GPRS	QB GSM/GPRS	DB 3G (EHS5-E) DB 3G (EHS5-US) DB 2G	QB GSM/GPRS	PB 3G QB 2G	QB GSM/GPRS	DB 3G (EU/US) DB 2G (EU/US)
Embedded processing	–	Java™	Java™	–	Java™	–	–
Extended memory	Yes	Yes	Yes	Yes	Yes	–	–
GPS/Glonass	–	–	–	–	–	–	–
Dimensions (mm)	27.6 x 18.8 x 2.3	27.6 x 18.8 x 2.3	27.6 x 18.8 x 2.3	27.6 x 18.8 x 2.7	27.6 x 25.4 x 2.3	51 x 30 x 4.8	51 x 30 x 4.7
Temperature range	-40 to +90 °C	-40 to +85 °C	-40 to +85 °C	-40 to +90 °C	-30 to + 85 °C	-40 to +85 °C	-40 to +85 °C
Voice	Yes	Yes	Yes	Yes	Yes	–	–
Data transmission							
LTE	–	–	–	–	–	–	–
HSPA	–	–	7.2 Mbps	–	7.2 Mbps	–	7.2 Mbps
UMTS	–	–	Yes	–	Yes	–	Yes
CDMA	–	–	–	–	–	–	–
EDGE	–	–	Class 12	Class 10	Class 12	–	Class 12
GPRS	Class 10	Class 12	Class 12	Class 10	Class 12	Class 10	Class 12
CSD	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SMS	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fax	Yes	Yes	–	–	–	Yes	–
TCP/IP connectivity	Yes	Yes	Yes	Yes	Yes	Yes	–
Prepared for eCall/ERA GLONASS	–	–	–	Yes	–	–	–
Interfaces							
Antenna connector	via LGA pads	via LGA pads	via LGA pad	via LGA pads	via LGA pad	U.FL-R-SMT	U.FL-R-SMT
Antenna solder pad	–	–	–	–	–	–	–
Board-to-board connector	–	–	–	–	–	52 Pin PCIe	52 Pin PCIe
Surface mounting	LGA	LGA	LGA	LGA	LGA	–	–
Audio analogue/digital	1x/1x	1x/1x	-/1x	1x/1x	-/1x	–	–
Serial interfaces	2x	2x	2x	2x	2x	–	–
RS485	–	–	–	–	–	–	–
USB	–	Yes	Yes	–	Yes	Yes	Yes
HSIC	–	–	Yes	–	Yes	–	–
Ethernet	–	–	–	–	–	–	–
I²C bus	Yes	Yes	Yes	Yes	Yes	–	–
SPI bus	–	Yes	Yes	–	Yes	–	–
ADC/DAC	1x/1x	1x/	1x/-	1x/	1x/-	–	–
Dedicated multiple GPIOs (digital)	Yes	Yes	Yes	Yes	Yes	–	–
Approvals							
R&TTE/GCF	Yes	Yes	EHS5-E	Yes	Yes	Yes	EHS5-E model
FCC, UL, IC, PTCRB	BGS2-W	Yes	EHS5-US	Yes	Yes	Yes	EHS5-US model
CE	Yes	Yes	EHS5-E	Yes	Yes	Yes	EHS5-E model
Local operator certifications	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Automotive e-mark	–	–	–	Yes	–	–	–
Special features							
Over-the-air update	–	Yes	Yes	–	Yes	–	–
RLS-monitor (Jamming detection)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Advanced temperature management	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NDIS driver	–	–	–	–	–	–	–
RIL driver	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Linux driver		Yes	Yes	–	Yes	Yes	Yes
Multiplex driver Microsoft® Windows	Yes	Yes	Yes	Yes	Yes	–	–
SIM access profile	–	–	–	Yes	–	–	–
Advanced automotive feature (inc eCall)	–	–	–	Yes	–	–	–
IMDS listed & GADSL compliant	–	–	–	Yes	–	–	–
Environmental regulations							
RoHS compliant	Yes	Yes	Yes	Yes	Yes	Yes	Yes
WEEE compliant	–	–	–	–	–	–	–

Product family	Industrial PLUS							
Product	PHS8	PXS8	PCS3	PVS8	PLS8	AGS2-E	AHS2	AHS3
	HSPA+	EV-DO/HSPA+	CDMA	EV-DO	LTE/DC-HSPA	Automotive	Automotive	Automotive
gemalto security to be free								
DB: dual band QB: quad band PB: penta band	PB 3G (PHS8-P) DB 3G (PHS8-E) DB 3G (PHS8-US) PB 3G (PHS8-K) PB 3G (PHS8-J) QB 2G	PB 3G QB 2G DB CDMA2000	DB CDMA 1xRTT	DB CDMA2000	QB LTE (PLS8-E) QB LTE (PLS8-US) TB 3G (EU/US) DB 2G (EU/US)	QB GSM/GPRS	DB 3G (EU) DB 2G (EU)	PB 3G QB 2G
Embedded processing	–	–	–	–	–	–	–	–
Extended memory	–	–	–	–	–	–	–	–
GPS/Glonass	Yes	Yes	Yes	Yes	Rel 2	Yes	–	Yes
Dimensions (mm)	33 x 29 x 2.0	33 x 29 x 2.0	33 x 29 x 2.0	33 x 29 x 2.0	33 x 29 x 2.0	33 x 29 x 2.0	33 x 29 x 2.4	33 x 29 x 2.4
Temperature range	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C
Voice	Yes	Yes	Yes	Yes	Rel 2	Yes	Yes	Yes
Data transmission								
LTE	–	–	–	–	100Mbps	–	–	–
HSPA	14.4 Mbps	14.4 Mbps	–	–	42Mbps	–	14.4 Mbps	14.4 Mbps
UMTS	Yes	Yes	–	–	Yes	–	Yes	Yes
CDMA	–	–	Yes	Yes	–	–	–	–
EDGE	Class 12	Class 12	–	–	Class 12	–	Class 12	Class 12
GPRS	Class 12	Class 12	–	–	Class 12	Class 12	Class 12	Class 12
CSD	Yes	Yes	–	–	Yes	Yes	Yes	Yes
SMS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fax	–	–	–	–	–	–	–	–
TCP/IP connectivity	Yes	Yes	–	–	–	Yes	Yes	Yes
Prepared for eCall/ERA GLONASS	–	–	–	–	–	–	Yes	Yes
Interfaces								
Antenna connector	via LGA pads	via LGA pads	via LGA pads	via LGA pads	via LGA pads	via LGA pads	via LGA pads	via LGA pads
Antenna solder pad	–	–	–	–	–	–	–	–
Board-to-board connector	PH8/PH8-P	–	–	–	–	–	–	–
Surface mounting	LGA	LGA	LGA	LGA	LGA	LGA	LGA	LGA
Audio analogue/digital	1x/1x	1x/1x	1x/1x	1x/1x	Rel 2	1x/1x	1x/1x	1x/1x
Serial interfaces	1x	1x	1x	1x	Rel 2	1x	1x	1x
RS485	–	–	–	–	–	–	–	–
USB	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
HSIC	–	–	–	–	–	–	–	–
Ethernet	–	–	–	–	–	–	–	–
I²C bus	Yes	–	–	–	–	Yes	Yes	Yes
SPI bus	–	–	–	–	–	–	–	–
ADC/DAC	–	–	–	–	–	–	–	–
Dedicated multiple GPIOs (digital)	–	–	–	–	–	–	Yes	–
Approvals								
R&TTE/GCF	Yes	Yes	–	–	PLS8-E	Yes	Yes	Yes
FCC, UL, IC, PTCRB	Yes	Yes	Yes	Yes	PLS8 -US	Yes		Yes
CE	Yes	Yes	Yes	Yes	PLS8-E	Yes	Yes	Yes
Local operator certifications	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Automotive e-mark	–	–	–	–	–	–	Yes	Yes
Special features								
Over-the-air update	–	–	–	–	–	–	–	–
RLS-monitor (Jamming detection)	–	–	–	–	–	–	Yes	Yes
Advanced temperature management	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NDIS driver	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
RIL driver	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Linux driver	Yes	Yes	Yes	Yes	Yes	Yes		
Multiplex driver Microsoft® Windows	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SIM access profile	–	–	–	–	–	–	Yes	Yes
Advanced automotive feature (inc eCall)	–	–	–	–	–	–	Yes	Yes
IMDS listed & GADSL compliant	–	–	–	–	–	–	Yes	Yes
Environmental regulations								
RoHS compliant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
WEEE compliant	–	–	–	–	–	–	–	–

Product family	Terminals				
Product	BGS2-T	EHS5-T	EHS6-T	BGS5-T	TC65-T
	GPRS	HSPA	HSPA	GPRS	GPRS
gemalto security to be free					
DB: dual band QB: quad band PB: penta band	QB GSM/GPRS	DB 3G (EU) DB 2G (EU)	PB 3G QB 2G	QB GSM/GPRS	QB GSM/GPRS
Embedded processing	–	Java™	Java™	Java™	Java™
Extended memory	–	Yes	Yes	Yes	–
GPS/Glonass	–	–	–	–	–
Dimensions (mm)	80 x 55 x 23	115 x 86 x 26	115 x 86 x 26	115 x 86 x 26	90 x 130 x 38
Temperature range	-30 to +75 °C	-30 to +65 °C	-30 to +65 °C	-30 to +65 °C	-30 to +75 °C
Voice	–	–	–	–	Yes
Data transmission					
LTE	–	–	–	–	–
HSPA	–	7.2 Mbps	7.2 Mbps	–	–
UMTS	–	Yes	Yes	–	–
CDMA	–	–	–	–	–
EDGE	–	Class 12	Class 12	–	–
GPRS	Class 10	Class 12	Class 12	Class 12	Class 12
CSD	Yes	Yes	Yes	Yes	Yes
SMS	Yes	Yes	Yes	Yes	Yes
Fax	Yes			–	Yes
TCP/IP connectivity	Yes	Yes	Yes	Yes	Yes
Prepared for eCall/ERA GLONASS	–	–	–	–	–
Interfaces					
Antenna connector	SMA (Female)	SMA (Female)	SMA (Female)	SMA (Female)	SMA (Female)
Antenna solder pad	–	–	–	–	–
Board-to-board connector	–	–	–	–	–
Surface mounting	–	–	–	–	–
Audio analogue/digital	–	–	–	–	Handset interface
Serial interfaces	9 Pin Sub-D	4 Wire	9 Pin Sub-D + 4 Wire	9 Pin Sub-D + 4 Wire	9 Pin Sub-D
RS485	RS485 Version	Yes	–	–	–
USB	–	Yes	EHS6T-USB	Yes	–
HSIC	–	–	–	–	–
Ethernet	–	–	EHS6-LAN	–	–
I²C bus	–	Yes	Yes	Yes	Yes
SPI bus	–	Yes	Yes	–	Yes
ADC/DAC	–	–	–	–	2x/1x
Dedicated multiple GPIOs (digital)	–	Yes	Yes	Yes	Yes
Approvals					
R&TTE/GCF	Yes	Yes	Yes	Yes	Yes
FCC, UL, IC, PTCRB	Yes	–	Yes	Yes	Yes
CE	Yes	Yes	Yes	Yes	Yes
Local operator certifications	Yes	Yes	Yes	Yes	Yes
Automotive e-mark	–	–	–	–	Yes
Special features					
Over-the-air update	Yes	Yes	Yes	Yes	Yes
RLS-monitor (Jamming detection)	Yes	Yes	Yes	Yes	–
Advanced temperature management	Yes	Yes	Yes	Yes	Yes
NDIS driver	–	–	–	–	–
RIL driver	Yes	Yes	Yes	Yes	Yes
Linux driver		Yes	Yes	Yes	–
Multiplex driver Microsoft® Windows	Yes	Yes	Yes	Yes	Yes
SIM access profile	–	–	–	–	–
Advanced automotive feature (inc eCall)	–	–	–	–	–
IMDS listed & GADSL compliant	–	–	–	–	–
Environmental regulations					
RoHS compliant	Yes	Yes	Yes	Yes	Yes
WEEE compliant	Yes	Yes	Yes	Yes	Yes

Product family	Legacy Modules						
Product	MC75i/EES3	TC65i/EGS5	TC63i/EGS3	BGS3	MC55i-W	BG2	PH8
	EDGE	GPRS	GPRS	GPRS	GPRS	GPRS	HSPA+
gemalto security to be free							
DB: dual band QB: quad band PB: penta band	QB GSM/GPRS EDGE	QB GSM/GPRS	QB GSM/GPRS	QB GSM/GPRS	QB GSM/GPRS	QB (BG2-W) DB (BG2-E) GSM/GPRS	PB 3G QB 2G
Embedded processing	–	Java™	–	–	–	–	–
Extended memory	–	TC65i-X/EGS5-X	–	–	–	–	
GPS/Glonass	–	–	–	–	–	–	Yes
Dimensions (mm)	33.9 x 35 x 3.3	33.9 x 35 x 3.3	33.9 x 35 x 3.3	33.9 x 29.6 x 3.2	35 x 32.5 x 2.95	31 x 26.7 x 3.0	33.9 x 50 x 3.1
Temperature range	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +85 °C	-40 to +85 °C*	-40 to +85 °C	-40 to +85 °C
Voice	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Data transmission							
LTE	–	–	–	–	–	–	–
HSPA	–	–	–	–	–	–	14.4 Mbps
UMTS	–	–	–	–	–	–	Yes
CDMA	–	–	–	–	–	–	–
EDGE	Class 12	–	–	–	–	–	Class 12
GPRS	Class 12	Class 12	Class 12	Class 10	Class 10	Class 10/8	Class 12
CSD	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SMS	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fax	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TCP/IP connectivity	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Prepared for eCall/ERA GLONASS	–	–	–	–	–	–	–
Interfaces							
Antenna connector	U.FL-R-SMT	U.FL-R-SMT	U.FL-R-SMT	via LGA pad	U.FL-R-SMT	60-pin	3 x U.FL-R-SMT
Antenna solder pad	EES3	Yes	Yes	–	Yes	–	–
Board-to-board connector	80-pin	80-pin	80-pin	–	50-pin	60-pin	80-pin
Surface mounting	EES3	–	–	LGA	–	–	–
Audio analogue/digital	2x/1x	2x/1x	2x/1x	2x/1x	1x/1x	1x/-	1x/1x
Serial interfaces	2x	2x	2x	2x	2x	2x	1x
RS485	–	–	–	–	–	–	–
USB	Yes	Yes	Yes	–	–	–	Yes
HSIC	–	–	–	–	–	–	–
Ethernet	–	–	–	–	–	–	–
I²C bus	Yes	Yes	Yes	–	–	Yes	–
SPI bus	Yes	Yes	Yes	–	–	–	–
ADC/DAC	–	2x/1x	–	–	–	1x/1x	–
Dedicated multiple GPIOs (digital)	–	Yes	–	–	–	Yes	–
Approvals							
R&TTE/GCF	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FCC, UL, IC, PTCRB	Yes	Yes	Yes	Yes	Yes	BG2-W	Yes
CE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Local operator certifications	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Automotive e-mark	–	–	–	–	–	–	–
Special features							
Over-the-air update	–	Yes	–	–	–	–	–
RLS-monitor (Jamming detection)	Yes	Yes	Yes	Yes	–	–	–
Advanced temperature management	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NDIS driver	–	–	–	–	–	–	Yes
RIL driver	Yes	–	–	Yes	Yes	–	Yes
Linux driver	–	–	–	–	–	–	Yes
Multiplex driver Microsoft® Windows	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SIM access profile	Yes	Yes	Yes	–	–	–	–
Advanced automotive feature (inc eCall)	–	–	–	–	–	–	–
IMDS listed & GADSL compliant	–	–	–	–	–	–	–
Environmental regulations							
RoHS compliant	Yes	Yes	Yes	Yes	Yes	Yes	Yes
WEEE compliant	–	–	–	–	–	–	–

CLOUDGATE

CloudGate is a M2M solution that includes an intelligent M2M gateway, an open M2M application development environment and a cloud based provisioning service (CloudGate Universe). It meets all the market requirements for a robust, secure and feature rich routing platform that will not let customers down in the field.

Benefits at a glance:

- Simple, value priced M2M IP connectivity
- Automatic connection monitoring and error recovery
- Secure, redundant firmware and configuration images
- Unique software and hardware configuration flexibility
- Automatic provisioning of custom middleware

PART OF THE DIGITAL SIGNAGE ECOSYSTEM

Many digital signage implementations use a 3G USB modem (dongle) for the connection. This is an unreliable, unstable, unmanageable solution. Using CloudGate within digital signage projects will provide many advantages for all involved parties:

- Guaranteed restart after power outage
- CloudGate will monitor the connection quality and keep it alive
- CloudGate will reboot (fully or partially) when needed
- CloudGate can prioritise its 3G, Wi-Fi and Ethernet connection depending on the available network and fall-back scenarios
- CloudGate can create at the same time a "public" hotspot
- With the Power over Ethernet Switch card, small displays can be directly connected avoiding additional display power supply
- CloudGate is ideal for "mobile" digital signage (e.g. on bus, taxi, train...) and can even support "location based signage" by use of the built-in GPS functionality

CONNECTING AN ATM OR KIOSK TO THE CLOUD

Many stand alone ATMs or other types of kiosks have need for their own connectivity. Due to the location they are placed (e.g. in a park, a zoo or mall) they don't have direct access to a network connected to the cloud.
The CloudGate, in its base configuration (LAN to 3G), installs easily into the enclosure providing a ready Ethernet port to enable connectivity to the cloud.

The CloudGate will also monitor the connection to the cloud and automatically address connectivity issues to prevent service technicians from being dispatched.

Simple, value priced WWAN M2M IP connectivity

The CloudGate M2M Gateway from Option provides competitively priced LAN to 2G and 3G WWAN routing and GPS functionality. The CloudGate is simple to configure locally or remotely from your PC, tablet or SmartPhone.

Reliable and secure

CloudGate automatically resolves common problems associated with wireless M2M connectivity. Built-in software and hardware watchdogs continuously monitor each component of the product and the product's connectivity to home servers. In the event an issue is detected, the product proactively takes steps to re-establish connectivity.
All software and configuration images are protected with digital signatures and have dual rollback images that allow the product to revert to previous working settings if an issue is detected. All management functions are protected by certificate and/or password based security mechanisms and all management actions take place over hardware assisted encrypted links.

Features	Sub Feature	Description
WWAN Modem	Supported frequency bands	▪ GSM/GPRS/EDGE: 850/900/1800/1900 MHz ▪ UMTS/HSDPA/HSUPA/HSPA+: 800-850/900/1900/2100 MHz and AWS band (1700/2100 MHz) (B1, B2, B4, B5, B6, B8)
	Max. Connectivity speeds	▪ HSPA+: 14.4 Mbps (Cat 10) down 5.76 (Cat 6) up ▪ HSPA+ Rel 7 SW features CPC (DTX/DRX), HS-SCCH-less operation, Enhanced CELL_FACH, Enhanced L2, EF-DPCH
	Rx Diversity	▪ Simultaneous Equalization and Rx Diversity on all bands, except for GSM/GPRS/EDGE
	Connectors	▪ 1 x SMA: WWAN Main ▪ 1 x SMA: WWAN Div
	Antenna connector	▪ 2 x SMA
	Visual feedback	▪ Seven 3 color LEDs showing system status and signal strength
GPS	Assisted/ Standalone GPS	▪ Standalone GPS, Assisted GPS, gps OneXTRA™ ▪ Wideband GPS processing (20MHz) for improved measurement accuracy
CPU		▪ ARM926EJ-S @ 450MHz ▪ Memory available for customer applications ▪ 30 Mb R/O flash for executables ▪ 30 Mb R/W flash shared with system ▪ 40 Mb free RAM ▪ 1 Mb Configuration data
Ethernet (IEEE 802.3)		▪ 10/100Mb/s RJ45 Connector
SIM	USIM/SIM connection	▪ USIM/SIM connection – Class B and Class C
Expansion Slot 1 & 2		▪ Expansion board for IO functions such as serial, USB, GPIO, WiFi
Power	DC Power in	▪ 9-33 V DC
	Connector type	▪ Micro-Fit 3.0™, Dual Row, 4 Circuits
	Current consumption	▪ All measurements at 12V DC ▪ CloudGate attached to 2G network, no Ethernet: 121mA. ▪ CloudGate attached to 2G network, Ethernet connected: 136mA ▪ CloudGate attached to 2G network, no Ethernet, 2G call (2Tx, 32dBm): 270mA, peak = 772mA ▪ CloudGate attached to 3G network, no Ethernet, 3G call @ 2100MHz (band I): 341mA
Case	Dimensions (w x d x h)	▪ 115 mm × 105 mm × 45 mm
	Weight	▪ 180 g
	Mounting	▪ 6 through holes for M4 bolts - 2 x 2 compatible with VESA Mount MIS-D 75 (Optional standard DIN rail mounting interface)
Enviromen-tals	Operating temperature	▪ -30°C to 70°C
	Storage temperature	▪ -40°C to +85°C
	Humidity operational	▪ 5% - 95% non condensing
Certification		▪ IC ▪ CE
Standards compliance		▪ ROHS, Reach

Flexible and cost effective to integrate and deploy

CloudGate provides unique flexibility that allows customers and system integrators to tailor the product to their solution or even site specific requirements. CloudGate incorporates two hardware expansion slots that allow the CloudGate to be enhanced with additional radio and/or wired interfaces. The expansion cards are simple and quick to install, allowing the field upgrade of the device when new functionality is required.

A range of accessory cards including wireless LAN Access Point and Client, RS-232 and RS-485, Ethernet switch are available from Option and all the design details of the expansion card can be licensed free of charge to partners allowing you to add value with your own hardware products. CloudGate also allows simple integration and provisioning of customer or system integrator middleware and applications on the device. The automated cloud provisioning system means that each device can be set with its own custom configuration and image that is automatically loaded from the cloud when it initially connects to the internet.

On top of the basic functionality the CloudGate can be tailored to meet your specific requirements by adding additional software and hardware, going from wired and wireless modules to designing your own expansion module, now or when a future need arises. Just make it as simple or full featured as you need it to be.

WiFi expansion card		▪ 802.11abgn ▪ Simultaneous access point and client mode ▪ Failover to Wireless LAN client for WAN connectivity ▪ Dual SSID
Low cost serial card		▪ 1 serial port RS-232 921.6K baud maximum speed
Industrial serial card		▪ One RS-232 serial port. 921,6 Kbaud maximum speed ▪ One 2KV isolated RS-485 serial port. 921,6 Kbaud maximum speed, Full duplex or half duplex, 2 wire or 4 wire. Switchable termination.
Ethernet switch		▪ 4 port 10/100 Base-T, µSD card ▪ 4 port 10/100 Base-T, µSD card with 2 ports Class 4 PoE or 4 ports up to Class 3 Power Over Ethernet (POE) to allow you to power external devices. (requires special power supply)
Developer card		▪ Extended format card with headers for all interfaces ▪ Includes headers for access to USB, USB on the go, RS-232, I2C, SPI/SD and GPIO lines. ▪ On board temperature sensor, relay, SD card slot and RS232 serial port

BLUETOOTH

BT SMART

Bluetooth SMART is a new low-power radio system that has been effectively added to the *Bluetooth* standards.

Bluetooth SMART was previously known as *Bluetooth* low energy.

Bluetooth SMART devices, being extremely low power can run from small coin cells for months. They can go into a sleep mode, be woken by external inputs and connect to most new smartphones and computers on the market today. The first to enter the market was the iPhone 4S as well as Apple's MacBook Air computers, but most new computers and smartphones launched since 2012 conform to the new standard.

Avnet Embedded has considerable experience in developing *Bluetooth* SMART applications, with examples available upon request. Of particular interest now is the Apple iBeacon standard, we have application examples for this, too.

Bluetooth Audio

There are a number of forms of *Bluetooth* Audio to consider. For simple hands-free systems that require monaural audio, the WT11i, WT12 or WT32 can be used. These all support the Handsfree Profile (HFP) and Headset Profile (HSP).

This allows for audio to be routed to a speaker and microphone, and telephone control data to be transferred, allowing for example, dial control and incoming call information.

For high-quality audio however, Advanced Audio Distribution Profile (A2DP) is employed. This provides stereo audio and is typically used to stream digital audio from MP3 players to wireless speakers and amplifiers. By default, A2DP uses the SBC codec, but the audiophile grade high-quality, low-latency (32 mS, compared to normal latency of ›150 mS) apt-X codec is available as an option on the WT32 and can be selected using API commands to the module.

apt-X is included in many smartphones and computer operating systems now, so demand for this high-quality connectivity is increasing, and the WT32 is ready to take advantage of this and provide this valuable extra feature set to your devices.

AVRCP is an additional facility in the WT32 and WT32i, which allows commands to be sent to the audio playing device to control volume, play/pause, and forward/back track control.

For purchasers of any of our development kits, we can provide online conferencing or on-site demonstrations to help you get up to speed with the devices and technologies.

Bluegiga offers a range of *Bluetooth* products from classic *Bluetooth* to *Bluetooth* SMART. All products offer a high integration level including antenna, *Bluetooth* radio, a protocol stack, application programming interfaces and radio type approvals. Bluegiga's iWRAP™ *Bluetooth* stack for standard *Bluetooth* products and the *Bluetooth* SMART development suite enables device manufacturers to quickly add secure and robust *Bluetooth* connectivity into both new and existing applications.

BLED112

The BLED112 is basically the BLE112 in a USB 'dongle'. Like the module, BGScript can be run on the device, typically for detection and proximity applications, but it will find use as a serial interface over *Bluetooth* SMART, or simply to add *Bluetooth* 4.0 / SMART capability to computers that do not already have it. It is available separately and included in the *Bluetooth* SMART development kit.

BT111

The new BT111 combines both *Bluetooth* SMART and *Bluetooth* Classic on one module. It integrates a *Bluetooth* SMART Ready dual mode radio, HCI software stack, USB interface and an antenna. The BT111 is compatible with Windows and Linux operating systems and Microsoft and BlueZ *Bluetooth* stacks.

BLE112 & BLE113

These *Bluetooth* SMART modules are single mode devices for low power sensors and accessories.
Both modules offer all *Bluetooth* SMART features: radio, stack, profiles and application space for customer applications, so an external processor is not needed. The modules also provide flexible hardware interfaces to connect sensors, simple user interfaces or even displays directly to the module, and with onboard programmability it can run applications too. The BLE112 features a USB interface, the BLE113 has I^2C.
Both modules support over the air application updates, with an extended memory version of the BLE113 available to simplify the process.

T32 & WT32i

This audio *Bluetooth* module provides the highest level of integration with integrated 2.4 GHz radio, DSP, battery charger, stereo codec and antenna ready to hit mono and stereo audio applications. The apt-X codec is available as an option. WT32 is also fully ready to support the *Bluetooth* 2.1 + EDR standard and the longer range WT32i supports *Bluetooth 3.0*.

BLE121LR

BLE121LR is a Bluetooth Smart Long Range module, possessing best-in-class RF performance and has been shown to provide Bluetooth Smart connectivity over as many as 450 meters. BLE121LR integrates Bluetooth radio, software stack and GATT based profiles. It can also host end user applications and has flexible hardware interfaces to connect to different peripherals or sensors.

Model number	**WT12**	**WT11i**	**WT41**	**WT32i**	**WT32**
Bluetooth					
Version	Bluetooth 2.1 + EDR	Bluetooth 2.1 + EDR	Bluetooth 2.1 + EDR	Bluetooth 3.0	Bluetooth 2.1 + EDR
Low energy support	-	-	-	-	-
BR/EDR support	Yes	Yes	Yes	Yes	Yes
Radio					
Typical TX power	+3 dBm	+17 dBm	+ 19 dBm	+ 6.5 dBm	+7 dBm
Typical RX sensitivity	-83 dBm	-85 dBm	-93 dBm	-90 dBm	- 88 dBm
Class	2	1	1	1.5	1.5
Typical range	30...50 m	200...400 m	500...1000 m	100...200 m	30...60 m
Integrated chip antenna	Yes	Yes	Yes	Yes	Yes
U.FL	-	Yes	Yes	Yes	Yes (W.FL)
50ohm pin	Yes	Yes	Yes	Yes	Yes
Interfaces					
UART	1	1	1	1	1
USB	2.0 device	2.0 device	2.0 device	2.0 device	2.0 device
SPI (debugging)	1	1	1	1	1
GPIO	6 configurable	6 configurable	6 configurable	10 configurable	10 configurable
Analogue IO	-	1 x 8-bit	1 x 8-bit	2 x 10-bit	2 x 10-bit
Audio interfaces					
PCM	1	1	1	1	1
I²S	-	-	-	1	1
SPDIF	-	-	-	1	1
Analogue	-	-	-	2 inputs/outputs	2 inputs/outputs
Microcontroller					
Architecture	16-bit RISC (XAP2)	16-bit RISC (XAP2)	16-bit RISC (XAP2)	16-bit	16-bit RISC (XAP2)
RAM	48 kB	48 kB	48 kB	48 kB	48 kB
Flash	8 Mbit	8 Mbit	8 Mbit	16 Mbit	8 Mbit
Operating voltage					
	2.6...3.6 V	2.6...3.6 V	2.6...3.6 V	1.8...4.4 V	1.8...3.6 V
Copper plated edges					
	No	Yes	Yes	No	Yes
Software development					
On-board applications	Yes	Yes	Yes	Yes	Yes
Software development service	Yes	Yes	Yes	Yes	Yes
SDK/IDE	CSR BlueLab	CSR BlueLab	CSR BlueLab	CSR BlueLab	CSR BlueLab
Bluetooth stack features					
Version	2.1 + EDR	2.1 + EDR	2.1 + EDR	3.0	2.1 + EDR
Integrated Bluetooth stack	Yes	Yes	Yes	Yes	Yes
Security simple pairing	Yes	Yes	Yes	Yes	Yes
Connections	1–7	1–7	1–7	1–6	1–7
Host API	ASCII commands/HCI	ASCII commands/ HCI	ASCII commands/HCI	ASCII commands	ASCII commands
HCI interface	Over UART/USB	Over UART/USB	Over UART/USB	-	-
Certifications					
BT/CE/FCC/IC approved	Yes	Yes	Yes	Yes	Yes
Dimensions (W x L)					
	26 x 14 x 2.4 mm	35.8 x 14.5 x 2.3 mm	35 x 14 x 3.5 mm	15.9 x 23.9 x 2.5 mm	24 x 16 x 0.3 mm

Model number	**BLE112**	**BLE113**	**BLE121LR**	**BT111**
Bluetooth				
Version	Bluetooth 4.0 single mode (SMART)	Bluetooth 4.0 single mode (SMART)	Bluetooth 4.0 single mode (SMART) long range	Bluetooth 4.0 dual mode (SMART Ready)
Low energy support	Yes	Yes	Yes	Yes (MASTER)
BR/EDR support	-	-		Yes
Radio				
Typical TX power	+3 dBm .. -23 dBm	0 dBm	+8 dBm	+8 dBm
Typical RX sensitivity	-87 dBm .. -93 dBm	-87 dBm .. -93 dBm	-98 dBm	-89 dBm
Class	-	-	1	1,5
Typical range	10...150 m	5...100 m	450 m	100 m+
Integrated chip antenna	Yes	Yes	Yes	Yes
U.FL	Yes	-	-	n/a
50ohm pin	Yes	Yes	Yes	Yes
Interfaces				
UART	2 configurable	2 configurable	2	n/a
USB	2.0 device	2.0 device	-	2.0 device
SPI (debugging)	2 configurable	2 configurable	2	1
GPIO	21 configurable	21 configurable	16 configurable	8
Analogue IO	8 x 12-bit configurable	7 x 12-bit configurable	7 x 12-bit	n/a
Audio interfaces				
PCM	-	-	-	1
I^2S	-	-	-	1
SPDIF	-	-	-	n/a
Analogue	-	-	-	n/a
Microcontroller				
Architecture	8-bit 8051	8-bit 8051	8-bit 8051	n/a
RAM	8 kB	8 kB	8 kB	n/a
Flash	128...256 kB	128...256 kB	256 kB	n/a
Operating voltage				
	2...3.6 V	2...3.6 V	2...3.6 V	1.7 ... 3.6 V
Copper plated edges				
	Yes	Yes	LGA	LGA
Software development				
On-board applications	Yes	Yes	Yes	n/a
Software development service	Yes	Yes	Yes	n/a
SDK/IDE	BGScript	BGScript	BGSDK	n/a
Bluetooth stack features				
Version	4.0	4.0	4.0	Bluetooth 4.0 dual mode (SMART Ready)
Integrated Bluetooth stack	Yes	Yes	Yes	HCI only
Security simple pairing	Yes	Yes	Yes	Yes
Connections	4-8	4-8	up to 8	7 BT CLASSIC, 5 SMART
Host API	Binary commands	Binary commands	BGAPI protocol	HCI only
HCI interface	-	-	-	USB
Certifications				
BT/CE/FCC/IC approved	Yes	Yes	Yes, Korea and Japan	Yes, Korea and Japan
Dimensions (W x L)				
	12.05 x 18.1 x 2.3 mm	15.75 x 9.15 x 2.1mm	14.7 x 13.0 x 1.8	9.3 x 13.05 x 2.3 mm

WI-FI

Wi-Fi, Wireless LAN or 802.11 is a local area network solution. Typically in the M2M space customers want low power and relatively low data rates i.e. a fully featured single frequency module with UART connectivity, on board TCP/IP and client functionality. More demanding applications need access point mode, on board web servers, and USB interfaces for faster throughput. All of which can be accommodated with Bluegiga's range of 802.11 b/g/n devices.

WF111

The WF111 is an SDIO connected module for Wi-Fi connectivity, primarily for Linux and Windows CE based systems. Drivers are provided and integration of the 12 x 19 mm module is very simple, with it already being pre-certified to CE, FCC and IC standards.The WF111 also supports Access Point mode, with the Linux host providing web server support as required. A development kit is available now with an SDIO format connector to allow fast evaluation on existing computer systems.

WF121

This stand-alone Wi-Fi module provides a fully integrated 2.4 GHz 802.11 b/g/n radio and a 32-bit microcontroller (MCU) platform for embedded applications requiring simple, low-cost and low-power wireless TCP/IP connectivity, also providing flexible interfaces for connecting to various peripherals. WF121 allows end user applications to be embedded onto the on-board 32-bit microcontroller using a simple Bluegiga BGScript™ scripting language, without the need for an additional MCU. WF121 can also be used in modem-like mode in applications where the external MCU is needed. The WF121 also supports Access Point mode, so that other client devices can connect to it. An on-board web server makes it simple for users to edit parameters, read statuses and download logged data amongst other applications. With an integrated 802.11 radio, antenna, single power supply, and regulatory certifications, WF121 provides a low-risk and fast time to market for applications requiring Wi-Fi connectivity.

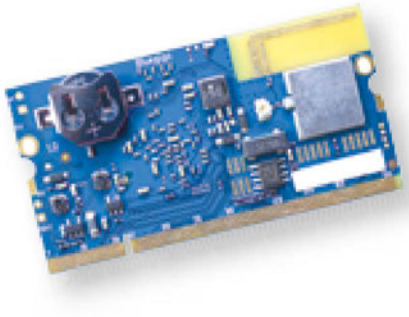
	WF111	**WF121**
Radio performance		
Typical TX power	+17 dBm	+17 dBm
Typical RX sensitivity	-91 dBm	-91 dBm
Line of sight range	300–500m	300–500m
Host interfaces		
SDIO	Yes	No
CSPI	Yes	No
UART	No	Yes
Peripheral interfaces		
SPI	-	up to 2*
UART	-	up to 4*
USB	-	1xOTG*
Ethernet MAC	-	1*
I²C	-	up to 2*
GPIO	6	up to 38
AIO	-	up to 10*
Microcontroller		
Architecture	-	MIPS 4K
MHz	-	80 Mhz
RAM	-	128 kB (64 kB free)
Flash	-	512 kB (256 kB free)
Operating voltage		
Operating voltage	1.8V and 3.3V	2.7V - 3.6V
Bluegiga APIs		
Bluegiga BGAPI binary protocol	-	Yes
Bluegiga BGLib host library	-	Yes
OS drivers		
Linux	Yes	Not needed
Windows	-	Not needed
Software development		
On-board applications	-	Yes
Bluegiga BGScript support	-	Yes
Firmware development service	-	Yes
SDK	Linux wireless tools	Bluegiga SDK
Dimensions (W x L x H)		
	12.0 x 19.0 x 2.1 mm	15.4 x 26.2 x 2.1 mm

Bluegiga APx4 Wireless System-on-Module

The Bluegiga APx4 is a small form factor, low power system-on-module that includes the latest wireless connectivity standards: 802.11 b/g/n and *Bluetooth* 4.0. APx4 is based on Freescale's i.MX28 processor family and runs an embedded Linux operating system based on the Yocto Project™. In addition to integrating the 454 MHz ARM9 processor, the wireless connectivity technologies and Linux operating system, the APx4 also includes several built-in applications, such as the 802.11 and *Bluetooth* 4.0 stacks, Continua v.1.5 compliant IEEE manager and many more. This combination provides an ideal platform for designing multi-radio wireless gateways that enable fast time to market and minimum R&D risks.

The Bluegiga APx4 software can be easily extended or tailored, customising the Linux operating system with applications. The motherboards for APx4 can be easily extended to include almost anything from 3G modems to Ethernet, audio interfaces and touchscreen displays.

The Bluegiga APx4 is an ideal product for applications requiring wireless or wired connectivity technologies, and the processing power of the ARM9 processor is ideal for applications such as health and fitness gateways, building and home automation, M2M, point-of-sale and industrial connectivity.

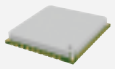


KEY FEATURES

- APx4 is a computing platform:
  - 450 MHz ARM9 core (Freescale i.MX28)
  - 64 Mb RAM
  - 128 Mb flash
  - Real-time clock
  - Linux operating system
  - SO-DIMM form factor
- A connectivity platform:
  - *Bluetooth* 4.0 dual-mode radio
  - 2.4 GHz 802.11 b/g/n radio
  - Wi-Fi access point mode
  - 10/100 Ethernet
  - USB 2.0 high speed
- With many extension options:
  - Up to 800 x 480, 24-bit display
  - Resistive touchscreen
  - MMC/SDIO
  - Multiple SPI, UART and I^2C
  - I^2S
  - PWM, GPIO and AIO
- Linux operating system:
  - Based on the Yocto Project™
  - Thousands of open source software packets available

When M2M becomes the Internet of Things, then data rates necessitate dual frequency solutions and ultimately 802.11ac, the "next generation Wi-Fi standard". Please see our full range of solutions from Lesswire in the coming pages for solutions to these needs.

Lesswire enables OEMs, device manufacturers and integrators to implement products and solutions with wireless connectivity for automotive and industrial markets with reduced effort and a faster time-to-market. Lesswire provides state of the art radio system components that facilitate the implementation of WLAN, Bluetooth 3 & 4, NFC and 868 technologies.

Category	WLAN	WLAN / Bluetooth		Car2X	Wireless M-Bus
Picture					
Product	WiBear 11g	WiBear 11n	WiBear 11ac	WiBear ITS	MBear
Type	1 Antenna	1 or 2 Antennas Single/Dual Frequency	1 or 2 Antennas Single/Dual Frequency	2 Antennas Single/Dual, Frequency	1 Antenna
Standards	IEEE 802.11 b,g	IEEE 802.11 (a),b,g,n Bluetooth 3.0	IEEE 802.11(a),b,g,n,ac Bluetooth 4.0	IEEE 802.11p ITS G5	prEN13757 - 4:2011
Status	Mass Production	Mass Production	Samples in Q2/2014	Samples in Q2/2014	Mass Production
Size (mm)	20 x 20	15 x 15	20 x 15	35 x 35	20 x 20
Frequency Range	2.4 GHz	2.4 GHz (and 5 GHz)	2.4 GHz (and 5 GHz)	5.1 to 5.9 GHz	868 MHz
Tx Power (max)	18 dBm	18 dBm	18 dBm	25 dBm	11 dBm
Power Consumption	1020 mW (max)	940 mW (max)	Tbd	Tbd	Rx: 80 mW typ, Tx: 130 mW typ
Power Supply	3.3 V and 1.8 V	3.3 V and 1.8 V	3.3 V	5 V	2.0 to 3.6 V
Interfaces	SDIO, G-SPI	SDIO, PCM	SDIO, HS-UART, PCM	USB 2.0, SPI	UART
Operating Temperature	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C
Grade	Automotive	Automotive	Automotive	Automotive	Industrial

Panasonic
ideas for life

Panasonic Industrial Device Sales Europe GmbH (PIDSEU) is a subsidiary of Panasonic Europe Ltd. The Panasonic family offers a number of chipset architectures spanning 2.4 GHz single mode modules such as Classic *Bluetooth* (2.1 EDR and 3) and *Bluetooth* 4.0 (*Bluetooth* SMART). Extending the versatility of this footprint, a number of Dual Mode (Smart Ready) modules incorporating *Bluetooth* SMART or ANT and Classic *Bluetooth* are offered. Completing the range, ISM and 802.15.4 products are available. All products are fully certified modules and are ideally suited for medium and high volume applications.

PAN1740

PAN1740 is the next generation *Bluetooth* Low Energy Module from Panasonic with an extremely small form factor of 9.0mm x 9.5mm, and extremely low ‹5mA Tx and Rx consumption.

PAN1322

Available in two form factors, with and without antenna versions, this is perfect for SPP only, cost sensitive applications. It is interchangeable with its HCI counterpart, the PAN1320.

PAN1026

A dual mode *Bluetooth* SMART Ready (4.0) module, Serial Port Profile (SPP) is on the PAN1026, with other profiles and the low-energy functions controlled via HCI. The module even supports co-existence with Wi-Fi, allowing it to share an antenna.

Wireless M-Bus PAN7580

The European standard for networking and remote reading of utility meters, Wireless M-Bus is supported in this module, with all current modes of operation and the ability to operate as a data collector, repeater, network monitor etc. Tools are available for remote configuration and control of the device.

Category	Bluetooth 2.1			Bluetooth SMART Ready	Bluetooth ANT	Bluetooth SMART	Bluetooth SMART	Bluetooth SMART Ready
Module picture								
Name Type Others	PAN1310/20 (no/with antenna) HCI - EDR	PAN1311/22 (no/with antenna) SPP - EDR	PAN1315/25A (no/with antenna) HCI - EDR	PAN1316/26 (no/with antenna) HCI SMART Ready	PAN1317/27 (no/with antenna) HCI SMART Ready	PAN1720/21 (with antenna) embedded SMART	PAN1740 (with antenna) embedded SMART	PAN1026 (with antenna) SPP SMART Ready
Size [mm]	11.6 x 8.7 x 1.8 15.6 x 8.7 x 2.8	11.6 x 8.7 x 1.8 15.6 x 8.7 x 1.8	9.0 x 6.5 x 1.8 9.0 x 9.5 x 1.8	9.0 x 6.5 x 1.8 9.0 x 9.5 x 1.8	9.0 x 6.5 x 1.8 9.0 x 9.5 x 1.8	15.6 x 8.7 x 1.8	9.0 x 9.5 x 1.8	15.6 x 8.7 x 1.8
Used ICs	PMB8763	PMB8754	CC2560A	CC2564	CC2567	CC2540 / 41	DIALOG	TC35661
Status	Mass production	Mass production	Mass production	Mass production	Mass production	Mass production	Engineering samples	Mass production
Rx sensitivity [dBm]	-86 BER 10^{-3}	-86 BER 10^{-3}	-93 BER 10^{-3}	-93 BER 10^{-3}	-93 BER 10^{-3}	-94 BER 1%	-93 BER 1%	-88 BER 10^{-3}
Tx power (max.)	+4 dBm	+4 dBm	+10.5 dBm	+10.5 dBm	+10.5 dBm	+3 dBm	0 dBm	+4 dBm
Operating temperature	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C
Power supply	2.9 to 4.1 V	2.9 to 4.1 V	1.8 to 4.8 V	1.8 to 4.8 V	1.8 to 4.8 V	2.0 to 3.6 V	1.8 to 3.3 V	1.8 or 3.0 V
Current consumption	80 µA (sleep) 40 mA (Tx,EDR)	80 µA (sleep) 40 mA (Tx,EDR)	135 µA (sleep) 40 mA (Tx,EDR)	135 µA (sleep) 40 mA (Tx,EDR)	135 µA (sleep) 40 mA (Tx,EDR)	Tx 23 mA -6 dBm Rx18 mA, Sleep<1 µA	Tx/Rx 4.9 mA	<100 µA (sleep) 46 mA (ACL; DH1)
Frequency range	2.4 GHz	2.4 GHz	2.4 GHz	2.4 GHz	2.4 GHz	2.4 GHz	2.4 GHz	2.4 GHz
Number of GPIOs	>15	>15	2	2	2	19	12	2
Interfaces	GPIO, PCM, UART, JTAG	GPIO, UART, JTAG	GPIO, PCM, UART	GPIO, PCM, UART	GPIO, PCM, UART	GPIO, UART USB only 2540	GPIO, UART, SPI, I²C, 3axis QD, ADC	GPIO, UART
Data rate (max. air)	3 MBit/s (gross) 2170 kBit/s (net)	3 MBit/s (gross) 190 kBit/s (net)	3 MBit/s (gross)	3 MBit/s (gross)	3 MBit/s (gross)	1 MBit/s (gross)	1 MBit/s	3 MBit/s (gross)

Category	ISM (Market for Industrial-Scientific-Medical Solutions)					IEEE 802.15.4 (2.4 GHz)			
Module picture									
Name Type Others	PAN7550 Wireless M-Bus Steinbeis Stack	PAN7580 Wireless M-Bus Steinbeis Stack	PAN2580 Mesh Software Synapse Stack	PAN235x ‹1 GHz Transceiver Module	PAN2365 2.4 GHz Transceiver Module	PAN4720 2.4 GHz Modem TI SW Stack	PAN4580 Mesh Software Synapse Stack	PAN4555 AT Command Set & Mesh Software	PAN4561 H/M/L AT Command Set & Mesh Software
Size [mm]	32.0 x 13.7 x 2.9	29.8 x 19.0 x 2.6	29.8 x 19.0 x 2.6	8.0 x 8.2 x 1.9	8.0 x 8.2 x 1.9	15.6 x 8.7 x 1.8	29.8 x 19.0 x 2.6	16.4 x 12.2 x 2.2	35.0 x 15.0 x 3.8
Used ICs	MSP430/CC1101	SiLabs SI1002	SiLabs SI100x	CC1101	CC2500	CC2530 / (31)	ATmega128RFA1	MC1321x	MC1321x/CC259x
Status	Mass production	Mass production	Mass production	Mass production	Mass production	Engin. samples	Mass production	Mass production	Mass production
Rx sensitivity [dBm]	-100 100 kBit/s	-102 100 kBit/s	-102 100 kBit/s	-104 2.4 kBit/s	-104 2.4 kBit/s	-93 250 kBit/s	-100 250 kBit/s	-92 250 kBit/s	-102/-102/-92
Tx power (max.)	+10 dBm	+ 13 dBm	+13 / +18 dBm	+10 dBm	0 dBm	2 dBm	3.0 dBm	0 dBm	+18.5/10/0dBm
Operating temperature	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C	-40 to +85 °C
Power supply	1.8 to 3.6 V	2.7 to 3.6 V	2.7 to 3.6 V	1.8 to 3.6 V	1.8 to 3.6 V	2.0 to 3.6 V	1.9 to 3.6 V	2.0 to 3.4 V	2.0 to 3.4 V
Current consumption	Tx: 30 mA +10 dBm Rx: 17 mA Sleep Mode: ‹1 µA	Tx: 46 mA Rx: 24 mA Sleep Mode: ‹1 µA	Tx: 46/85 mA Rx: 24 mA Sleep Mode: ‹1 µA	‹1 µA (sleep) 17 mA (Tx, 0 dBm)	‹1 µA (sleep) 21 mA (Tx, 0 dBm)	Tx: 39 mA Rx: 29 mA Sleep Mode: ‹1 µA	Tx: 20 mA 0 dBm Rx: 17 mA Sleep Mode: ‹1 µA	‹1 µA (off mode) 30 mA (Tx, -4 dBm)	‹1 / 2 µA (off mode) 30 / 210 mA (Tx, -4 / +20 dBm)
Frequency Range	863 to 928 MHz	868 MHz	863 to 928 MHz	300 to 1000 MHz	2.4 GHz	2.4 GHz	2.4 GHz	2.4 GHz	2.4 GHz
Number of GPIOs	27	18	18	2 Output	2 Output	19	33	19	33
Interfaces	GPIO, UART, SPI, JTAG	GPIO, UART, SPI, I²C, ADC	GPIO, UART, SPI, I²C, ADC	GPO, SPI	GPO, SPI	GPIO, UART (USB)	GPIO, 2 UART, SPI, ADC, JTAG 2 wire serial	GPIO, UART, SPI	GPIO, UART, I²C, BDM
Data rate (max. air)	500 kBit/s (gross)	256 kBit/s (gross)	256 kBit/s (gross)	500 kBit/s (gross)	500 kBit/s (gross)	250 kBit/s (gross)	2000 kBit/s (gross)	250 kBit/s (gross)	250 kBit/s (gross)

GPS

LOCOSYS
LOCOSYS Technology Inc.

Locosys is a longstanding and recognised leader in the GPS and GNSS market. With highly experienced technical and R&D teams, Locosys offers some of the smallest, innovative and feature rich GPS and GNSS products in the market. With modules and smart antennas spanning all major chipset brands and with ROM and Flash variants every application scenario has a solution. All products are of exceptional quality and are designed and manufactured in-house to ISO/TS 16949 2009.

S4-0606

The S4-0606 is a 6 x 6 x 1.35 mm fully featured GPS receiver based on the latest SiRF iV chipset. Supporting 48 GPS channels, and with the ability to filter out up to 8 active CW jammers users will be impressed with its performance and low power consumption in the most demanding of applications. Furthermore, by adding serial EEPROM, or using the host CPU's memory, users may enable SiRF CGEE (Client Generated Extended Ephemeris) a function that predicts satellite positions for up to 3 days and delivers CGEE-start time of less than 15 seconds without the need for any network assistance.

Precision GNSS TIMING module with T-RAIM

The ST-1612-T GNSS module can simultaneously acquire and track multiple satellite constellations including GPS and GLONASS. Supporting conventional USB and UART interfaces as well as a CAN interface the module is as at home in a timing application as in an Automotive one. When used as a timing module the 1PPS is even available when only one satellite is visible, and using position hold and Auto survey PPS accuracies of 25nS [1δ] are achieved.

KEY PRODUCTS

GNSS modules

GNSS smart antennas

GNSS mouse

In the product tables on the coming pages, please note the following colour codes:

- GPS
- GALILEO
- BEIDOU
- QZSS
- GLONASS

GNSS Modules

GNSS MODULES	Chipset	GPS	QZSS	Galileo	Glonass	BEDOU	Interface	Voltage	Power	VB	Operating temp	Dimensions	Memory	On Board LNA	DATA LOGGER	10hHz output	FORM FACTOR
S4-0606	CSR (SiRF IV)	●	●				UART/I2C/ SPI	1.71V ~ 1.89V	30mA	8uA	-40 ~ 85	6 x 6 x 1.2 mm	ROM				
S4-1513	CSR (SiRF IV)	●	●				UART	1.71V ~ 1.89V	27.5mA	660uA	-40 ~ 85	15 x 13 x 2.2 mm	FLASH				
S4-1513-2R	CSR (SiRF IV)	●	●				UART	3.0V ~ 3.6V	33mA	660uA	-40 ~ 85	15 x 13 x 2.2 mm	ROM				
S4-1513-2E	CSR (SiRF IV)	●	●				UART	3.0V ~ 3.6V	33mA	660uA	-40 ~ 85	15 x 13 x 2.2 mm	ROM+EEPROM				
S4-1613-2R	CSR (SiRF IV)	●	●				UART	3.0V ~ 3.6V	33mA	660uA	-40 ~ 85	15.9 x 13.1 x 2.2 mm	ROM				
S4-1613-2E	CSR (SiRF IV)	●	●				UART	3.0V ~ 3.6V	33mA	660uA	-40 ~ 85	15.9 x 13.1 x 2.2 mm	ROM+EEPROM				
S4-1612-2R	CSR (SiRF IV)	●	●				UART	3.0V ~ 3.6V	33mA	660uA	-40 ~ 85	16 x 12.2 x 2.2 mm	ROM				NEO
S4-1612-2E	CSR (SiRF IV)	●	●				UART	3.0V ~ 3.6V	33mA	660uA	-40 ~ 85	16 x 12.2 x 2.2 mm	ROM+EEPROM				NEO
MC-1010-2R	Mediatek	●	●				UART	3.0V ~ 4.3V	17mA	6uA	-40 ~ 85	10.1 x 9.7 x 2.0 mm	ROM	Y			MAX
MC-1010	Mediatek	●	●				UART	3.0V ~ 4.3V	17mA	6uA	-40 ~ 85	10.1 x 9.7 x 2.0 mm	Flash	Y	Y	Y	MAX
MC-1010-G	Mediatek	●	●	●	●		UART	3.0V ~ 4.3V	20mA	7uA	-40 ~ 85	10.1 x 9.7 x 2.0 mm	Flash	Y	Y	Y	MAX
MC-1010-B	Mediatek	●	●	●		●	UART	3.0V ~ 4.3V	21mA	7mA	-40 ~ 85	10.1 x 9.7 x 2.0 mm	Flash	Y	Y	Y	MAX
MC-1108	Mediatek	●	●				UART	3.0V~4.3V	17mA	6uA	-40 ~ 85	11.4 x 8.8 x 2 mm	Flash	Y	Y	Y	
MC-1108-G	Mediatek	●	●	●	●		UART	3.0V~4.3V	20mA	7uA	-40 ~ 85	11.4 x 8.8 x 2 mm	Flash	Y	Y	Y	
MC-1108-B	Mediatek	●	●	●		●	UART	3.0V~4.3V	21mA	7uA	-40 ~ 85	11.4 x 8.8 x 2 mm	Flash	Y	Y	Y	
MC-1513-2R	Mediatek	●	●				UART	3.0V ~ 4.3V	12mA	6uA	-40 ~ 85	15 x 13 x 2.2 mm	ROM				
MC-1513	Mediatek	●	●				UART	3.0V ~ 4.3V	12mA	5uA	-40 ~ 85	15 x 13 x 2.2 mm	Flash		Y	Y	
MC-1513-G	Mediatek	●	●	●	●		UART	3.0V ~ 4.3V	16mA	10uA	-40 ~ 85	15 x 13 x 2.2 mm	Flash		Y	Y	
MC-1513-B	Mediatek	●	●	●		●	UART	3.0V ~ 4.3V	16mA	7uA	-40 ~ 85	15 x 13 x 2.2 mm	Flash		Y	Y	
MC-1613-2R	Mediatek	●	●				UART	3.0V ~ 4.3V	18mA	6uA	-40 ~ 85	15.9 x 13.1 x 2.2 mm	ROM				
MC-1613	Mediatek	●	●				UART	3.0V ~ 4.3V	18mA	6uA	-40 ~ 85	15.9 x 13.1 x 2.2 mm	Flash		Y	Y	
MC-1613-G	Mediatek	●	●	●	●		UART	3.0V ~ 4.3V	23mA	10uA	-40 ~ 85	15.9 x 13.1 x 2.2 mm	Flash		Y	Y	
MC-1613-B	Mediatek	●	●	●		●	UART	3.0V ~ 4.3V	25mA	7uA	-40 ~ 85	15.9 x 13.1 x 2.2 mm	Flash		Y	Y	
MC-1612-2R	Mediatek	●	●				UART	3.0V ~ 4.3V	18mA	6uA	-40 ~ 85	16 x 12.2 x 2.2 mm	ROM				NEO
MC-1612	Mediatek	●	●				UART/USB	3.0V ~ 4.3V	18mA	6uA	-40 ~ 85	16 x 12.2 x 2.2 mm	Flash		Y	Y	NEO
MC-1612-G	Mediatek	●	●	●	●		UART	3.0V ~ 4.3V	23mA	10uA	-40 ~ 85	16 x 12.2 x 2.2 mm	Flash		Y	Y	NEO
MC-1612-B	Mediatek	●	●	●		●	UART	3.0V ~ 4.3V	25mA	7uA	-40 ~ 85	16 x 12.2 x 2.2 mm	Flash		Y	Y	NEO
ST-1612-G	ST micro	●	●	●	●		UART/CAN BUS/USB	3.0V ~ 3.6V	50mA	69uA	-40 ~ 85	16 x 12.2 x 2.2 mm	Flash			Y	NEO
ST-1612-T	ST micro	●	●	●	●		UART	3.0V ~ 3.6V	70mA	69uA	-40 ~ 85	16 x 12.2 x 2.2 mm	Flash			Y	NEO
MC-1722	Mediatek	●	●				UART	3.0V ~ 4.3V	18mA	6uA	-40 ~ 85	17 x 22.4 x 2.2 mm	Flash		Y	Y	
LS26030/31-2R	Mediatek	●	●				USB	3.0V ~ 3.6V	40mA	6uA	-40 ~ 85	PCIe Full/Half Mini Card	ROM				
LS26030/31	Mediatek	●	●				USB	3.0V ~ 3.6V	35mA	6uA	-40 ~ 85	PCIe Full/Half Mini Card	Flash		Y	Y	
LS26030/31-G	Mediatek	●	●	●	●		USB	3.0V ~ 3.6V	40mA	6uA	-40 ~ 85	PCIe Full/Half Mini Card	Flash		Y	Y	

GNSS Smart Antennas

GNSS SMART ANTENNAS	Chipset	GPS	QZSS	Galileo	Glonass	BEDOU	Interface	Voltage	Power	VB	Operating temp	Dimensions	Antenna size	Memory	DATA LOGGER	10hHz output	Connector type
LS2003C-2R	Mediatek	●	●				UART	3.0~4.3V	17mA	6uA	-40~85	15.5 x 15.5 x 6.6mm	15 x 15 x 4mm	ROM			SMT
LS2003C	Mediatek	●	●				UART	3.0~4.3V	17mA	6uA	-40~85	15.5 x 15.5 x 6.6mm	15 x 15 x 4mm	Flash	Y	Y	SMT
LS2003C-G	Mediatek	●	●	●	●		UART	3.0~4.3V	20mA	7uA	-40~85	15.5 x 15.5x 6.6mm	15 x 15 x 4mm	Flash	Y	Y	SMT
LS2003C-B	Mediatek	●	●	●		●	UART	3.0~4.3V	20mA	7uA	-40~85	15.5 x 15.5 x 6.6mm	15 x 15 x 4 mm	Flash	Y	Y	SMT
LS2003D-2R	Mediatek	●	●				UART	3.0~4.3V	17mA	6uA	-40~85	21 x 17 x 7.2mm	15 x15 x 4mm	ROM			1.0mm Pitch connector
LS2003D	Mediatek	●	●				UART	3.0~4.3V	17mA	6uA	-40~85	21 x 17 x 7.2mm	15 x 15 x 4mm	Flash	Y	Y	1.0mm Pitch connector
LS2003D-G	Mediatek	●	●	●	●		UART	3.0~4.3V	20mA	7uA	-40~85	21 x 17 x 7.2mm	15 x1 5 x 4mm	Flash	Y	Y	1.0mm Pitch connector
LS2003E-2R	Mediatek	●	●				UART	3.0~4.3V	17mA	6uA	-40~85	22 x 22 x 7.1mm	18 x 18 x 4mm	Flash			1.0mm Pitch connector
LS2003E	Mediatek	●	●				UART	3.0~4.3V	17mA	6uA	-40~85	22 x 2 2x 7.1mm	18 x 18 x 4mm	Flash	Y	Y	1.0mm Pitch connector
LS2003E-G	Mediatek	●	●	●	●		UART	3.0~4.3V	20mA	7uA	-40~85	22 x 22 x 7.1mm	18 x 18 x 4mm	Flash	Y	Y	1.0mm Pitch connector
LS2003E-B	Mediatek	●	●	●		●	UART	3.0~4.3V	20mA	7uA	-40~85	22x 22 x 7.1mm	18 x 18 x 4mm	Flash	Y	Y	1.0mm Pitch connector

GNSS Mouse

GNSS MOUSE	Chipset	GPS	QZSS	Galileo	Glonass	BEDOU	Voltage	Power	Operating temp	Memory	DATA LOGGER	10hHz output	Interface	Connector type	cable length
LS23030-2R	Mediatek	●	●				4.75~5.25	30mA	-40~85	ROM			USB	USB	2m
LS23030	Mediatek	●	●				4.75~5.25	22mA	-40~85	Flash	Y	Y	USB	USB	2m
LS23030-G	Mediatek	●	●	●	●		4.75~5.25	34mA	-40~85	Flash	Y	Y	USB	USB	2m
LS23030-B	Mediatek	●	●	●		●	4.75~5.25	34mA	-40~85	Flash	Y	Y	USB	USB	2m
LS23032-2R	Mediatek	●	●				4~6	20mA	-40~85	ROM			RS232	PS2	2m
LS23032	Mediatek	●	●				4~6	19mA	-40~85	Flash	Y	Y	RS232	PS2	2m
LS23032-G	Mediatek	●	●	●	●		4~6	22mA	-40~85	Flash	Y	Y	RS232	PS2	2m
LS23032-B	Mediatek	●	●	●		●	4~6	22mA	-40~85	Flash	Y	Y	RS232	PS2	2m
LS23035-2R	Mediatek	●	●				4~6	20mA	-40~85	ROM			RS232	PS2 with lock	5m
LS23035	Mediatek	●	●				4~6	19mA	-40~85	Flash	Y	Y	RS232	PS2 with lock	5m
LS23035-G	Mediatek	●	●	●	●		4~6	22mA	-40~85	Flash	Y	Y	RS232	PS2 with lock	5m
LS23035-B	Mediatek	●	●	●		●	4~6	22mA	-40~85	Flash	Y	Y	RS232	PS2 with lock	5m
LS23036-2R	Mediatek	●	●				4~6	20mA	-40~85	ROM			RS232	RJ-11	3m
LS23036	Mediatek	●	●				4~6	19mA	-40~85	Flash	Y	Y	RS232	RJ-11	3m
LS23036-G	Mediatek	●	●	●	●		4~6	22mA	-40~85	Flash	Y	Y	RS232	RJ-11	3m
LS23036-B	Mediatek	●	●	●		●	4~6	22mA	-40~85	Flash	Y	Y	RS232	RJ-11	3m

MODEMS, ROUTERS & GATEWAYS

Multi-Tech Systems has been delivering industry-leading M2M communications solutions since 1970. With more than 22 million devices deployed worldwide, Multi-Tech Systems focuses on helping customers achieve the shortest path to M2M (machine-to-machine) connectivity – from concept to implementation. Whether a project is simple or complex, Multi-Tech has the resources and expertise to customize a hardware or software solution that maximizes speed to market and return on investment. With onsite manufacturing and a broad portfolio of embedded and external solutions with long lifecycles, Multi-Tech has made M2M Simplified for thousands of customers around the globe. Multi-Tech's product portfolio extends to standard off-the-shelf embedded device networking *modems (the SocketModem family)*, external device networking modems and wireless routers *(MultiModem/MultiConnect family)*, and hardware development tools to Open Communications Gateways.

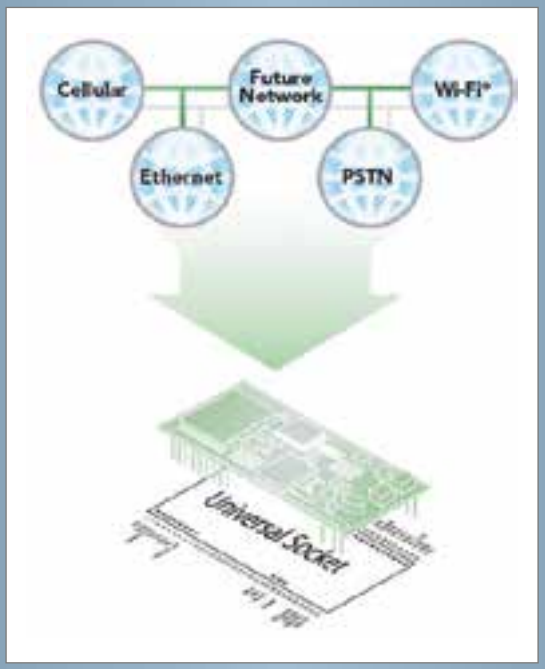
Open Communications Gateways

The MultiConnect OCG is an all-in-one application ready cellular hardware platform and Open Embedded Linux development environment that includes multiple interfaces and internal peripherals in one solution. It provides one of the quickest and most cost-effective ways to create a multitude of custom applications without the need to invest in bespoke hardware development.

- Fully certified and carrier approved, application ready solution
- Full Linux operating system
- 2 G or 3 G external or embedded gateway models
- 400 MHz ARM9 CPU
- Dedicated GPS receiver, optional

UNIVERSAL DESIGN & DEVELOPMENT

All Multi-Tech products follow a similar design ethos, pre-approved by carriers, country telecom agencies and certified as an end product in their own right, allowing easy integration or worldwide deployment whilst significantly reducing costs associated with certifications and engineering development.
Multi-Tech's Universal IP provides a consistent development interface for both embedded and external device networking modems, allowing developers to write a unique host application with freedom to select from either product family. Once deployed, your initial design and host application can quickly adjust to new technologies, essentially future-proofing your solution.



SOCKETMODEM® UNIVERSAL SOCKET FOOTPRINT

Wireless Routers & Cellular Modems.
Device Networking Products – To Suit Any Need

Multi-Tech offers a comprehensive selection of intelligent, ready-to-deploy cellular modems and intelligent wireless router solutions, with optional GPS capability that utilise standards-based 2G and 3G technologies.

New! First-ever Industrial M2M-quality Cellular USB Dongle

Multi-Tech's QuickCarrier™ USB-D cellular dongle is specifically designed and built for industrial-grade M2M communications applications. In stark contrast to consumer-type cellular dongles that can provide unreliable connectivity and often require frequent design or software changes, this modem delivers stability and reliability, yet meets the need for quick deployments. It offers 3G HSPA+ cellular technologies, an internal antenna, short message service (SMS), drivers for both Windows and Linux, AT command compatibility and pre-certification by major regulatory agencies.

Designed specifically for M2M applications, Multi-Tech's routers and modems provide a long, stable lifecycle and are durable, reliable and easy to deploy.

NEW! INTELLIGENT WIRELESS ROUTERS ENHANCED FUNCTIONALITY FOR REMOTE M2M APPLICATIONS

The MultiConnect® rCell intelligent HSPA+ wireless router offers a range of flexible connection protocols to support most M2M application requirements. It's housed in a high end, semi-industrial style chassis and provides on-board connectivity options with models that are configurable for Wi-Fi® and Bluetooth® operation as well as GPS tracking capability.

New chassis design offers:

- Smaller form factor
- Lower cost options
- Fully certified and approved
- Ethernet and serial port connectors
- Models specifically designed for European market

This affordable router solution is built for long life, delivers reliable data connectivity, and is out of the box ready for deployment configuration.

MultiModem/MultiConnect Cellular Modems & Wireless Routers Selector Guide								
	MultiModem® rCell Wireless Routers (MTCBA-)		MultiConnect® rCell 100 Series Wireless Routers (MTR-)	MultiModem® iCell Intelligent Modems (MTCMR-)		MultiConnect® Cell 100 Series Cellular Modems (MTC-)	MultiModem® Cell Cellular Modems (MTCBA-)	QuickCarrier™ USB-D USB Cellular Modem (MTD-)
Cellular Technology	3G/2G	2G	3G/2G + Wi-Fi & Bluetooth options	3G/2G	2G	3G/2G	2G	3G
Intelligence	Routing/Filtering/Firewall/Internet Sharing			Universal IP	Universal IP	Proprietary	Universal IP	Proprietary
Interface Options	RS232/ Ethernet	RS232/ Ethernet	RS232/Ethernet	RS232/USB2.0	RS232/ USB2.0	RS232/RS422/ USB 2.0	RS232/ RS422/ USB 2.0	USB 2.0
Optional GPS	Yes	Yes	Yes	Yes	Yes	No	No	No
Frequency Bands - 3G	850/900/1700 (AWS)/1900/2100	N/A	850/900/2100	850/900/1700 (AWS)/1900/2100	N/A	850/900/1700 (AWS)/1900/2100	N/A	850/900/1700/ 1900/2100
Frequency Bands – 2G	850/900/ 1800/1900	850/900/ 1800/1900	850/900/1800/ 1900	850/900/1800/ 1900	850/900/ 1800/1900	800/900/1800/ 1900	850/900/1800/ 1900	850/900/1800/ 1900
Temperature Range	-30 to +60°C	-35 to +75°C	-40 to +85°C	-30 to +60°C	-30 to +50°C	-40 to +85°C	-30 to +70°C	-40 to +50°C
Base Part Number	H5-EN2	E1-EN2/ G2-EN2	H6	H5/G2	E1 / G2	H5/G3	E1 / G2	H5

LTE, CDMA and EV-DO variants are available on all of the above products. Please contact us for details.

SocketModem® - Embedded Modems & Device Servers. Multiple Connectivity Options In One Standard Footprint

Multi-Tech offers pre-approved, ready-to-integrate cellular, Ethernet and analogue modem solutions that quickly and easily add communications capability to an existing or new product.

Multi-Tech's embedded modems and device servers provide the fastest, most efficient solution for adding 2G or 3G connectivity to M2M (machine-to-machine) applications.

Benefits of an embedded solution:

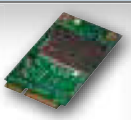
- Reduced total cost of ownership
- Reduced engineering effort
- Reduced time to market
- Easy product certifications for worldwide deployments
- Easy migration between cellular, analogue, Ethernet, and Bluetooth
- Easy migration to future technologies

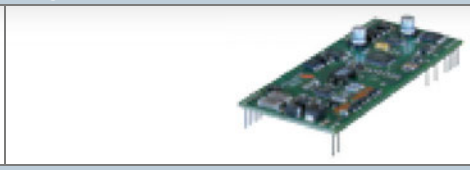
NEW!
PCI EXPRESS MINI CARD COMMUNICATION MODULES

Multi-Tech's new MultiConnect® PCIe communication modules in PCI Express® Mini Card form factor are European-ready, deliver penta-band HSPA+ 21 performance, and allow the option to add Voice, Bluetooth®, Wi-Fi® or GPS technology onboard. With multiple options permitting application flexibility, the MultiConnect PCIe also features an on-board power-supply regulator for optimal radio performance, an on-board SIM holder, and up to three UFL antenna connectors helping to simplify hardware design.

Developed with industrial applications in mind, this high quality, reliable solution simplifies M2M application development and well as provides a long and stable product life cycle for any solution.

SocketModem Embedded Cellular Modems and Bluetooth Device Servers Selector Guide

									
	SocketModem® iCell Intelligent Cellular Modems (MTSMC-)		SocketModem® Cell Cellular Modems (MTSMC-)			QuickCarrier USB-E USB Cellular Modems (MT100UCC-)		SocketWireless Bluetooth Device Servers (MTS2BTSMI-)	MultiConnect® PCIe Mini Card Module (MTCPIE-)
Cellular Technology	3G/2G	2G	3G/2G	2G	2G	3G	2G	Class 1 V2.0	3G + Wi-Fi & Bluetooth Option
Intelligence	Universal IP	Universal IP	Proprietary	Proprietary	Proprietary	Proprietary	Proprietary	NA	
Interface Options	Serial/USB 2.0	Serial	Serial or USB2.0 HS	Serial	Serial	Locking 4-pin USB2.0 HS	Locking 4-pin USB2.0	Serial	USB 2.0 and UART
Optional GPS	Yes	Yes	No	No	No	No	No	No	Yes
Frequency Bands - 3G	850/900/ 1700 (AWS) /1900/ 2100	N/A	850/900/ 1700 (AWS) /1900/ 2100	N/A	N/A	850/900/ 1700 (AWS)/ 1900/ 2100	N/A	N/A	850/900/1700 (AWS)/1900/2100
Frequency Bands – 2G	850/900/ 1800/ 1900	850/900/ 1800/1900	850/900/ 1800/1900	850/900/ 1800/1900	850/900/ 1800/1900	850/900/ 1800/1900	850/900/ 1800/1900	Max. range 100 meters	850/900/ 1800/1900
Temperature Range	-30 to +85°C	-40 to +85°C	-30 to +85°C	-40 to +85°C	-40 to +85°C	-30 to +85°C	-40 to +85°C	-40 to +70°C	-30 to +85°C
Base Part Number	H5-xx	G2-xx	H5	G2	G3	H5	G2-xx	5V & 3.3V models	H5-EU, H5-V-BW-EU

SocketModem Embedded Analogue Modems and Ethernet Device Servers Selector Guide					
					
	SocketModem® Analogue Modems			SocketModem® IP Intelligent Analogue Modems	SocketEthernet IP® Device Servers
Base Part Number	MT9234SMI-xx	MT5692SMI-xx	MT2492SMI-xx	MT5692SMI-IP-xx	MT100SEM-xx
Data Rate(s)	V.92/56K, V.34/33.6K	V.92/56K, V.34/33.6K	V.22bis/ 2400 baud	V.92/56K	DTE speeds up to 230K bps
Interface Options	Serial or Parallel	Serial or Parallel	Serial	Serial	10/100BaseT Ethernet, Asynchronous Serial
Intelligence	N/A	N/A	N/A	Universal IP	Universal IP
Fax Capability	V.34/33.6K or V.17/14.4K	V.17/14.4K	N/A	N/A	N/A
Input Voltage	5 or 3.3VDC	5 or 3.3VDC	5 or 3.3VDC	5 or 3.3VDC	5 or 3.3VDC
Temperature Range	-40 to +85°C	-40 to +85°C	0 to +70°C	-40 to +85°C	-40 to +85°C
Telecom Approvals	*Global	*Global	US/Canada/ Europe	*Global	*Global

*Global – for accuracy please request full country approval listing

Multi-Tech has earned the reputation of providing high-performing products by controlling all aspects of the development process including design, in-house manufacturing and testing. Quality assurance has always been the watchword of their manufacturing process. And rigid ISO 9001:2008 and ISO 13485 quality control systems include 100 percent functional testing for every Multi-Tech product.

Multi-Tech makes it easy and fast to connect your devices to networks anywhere in the world, working with clients in almost any market to enable cellular, analogue, Ethernet, Wi-Fi, *Bluetooth* and GPS capabilities into a solution. Multi-Tech has made M2M simplified for thousands of customers around the globe.

Multi-Tech provides a variety of embedded form factors to accomodate most design requirements

CABLES, CONNECTORS AND ANTENNAS

Antenovas M2M's high performing off-the-shelf gigaNOVA® antennas and RADIONOVA® RF Antenna Modules provide optimal embedded antenna solutions to meet the size, efficiency, low power consumption, reliability and cost objectives of OEMs, module vendors and system integrators offering products for wireless M2M applications in the consumer, enterprise, industrial, security, automotive and maritime industries.

Antenova M2M's antennas solutions have a proven track record in a broad range of wireless M2M and Embedded Device applications, including Telematics, Automatic Meter Reading (AMR), mHealth, Wireless Security, Home Automation, Trackers, Industrial Computing, Fixed Wireless Access and Electronic Shelf Labels.

NEW PRODUCTS AVAILABLE!

gigaNOVA 2.4 GHz antennas have become an industry standard for Bluetooth (BT, BT EDR, BT LE) and Wi-Fi applications, including new body worn medical monitors and expanded vehicle connectivity systems.

Kirbii A10472 ISM antenna addresses small size and reliable performance requirements for remote monitoring and security applications operating in the 896 MHz and 915 MHz bands.

Indica 2.4 GHz chip antenna is ideally suited for electronic shelf applications due to its small size.

GPS RADIONOVA RF Antenna Modules are ideally suited for portable and tightly integrated tracking and security devices.

Antenova Adds Rubra A10393 Cellular Penta-band SMD Antenna to gigaNOVA® Range of Standard Antennas

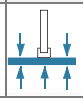
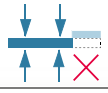
Rubra A10393 is a high performing cellular penta-band antenna incorporating Antenova's patented Magnetic Dipole Antenna (MDA) technology which provides robust and reliable performance across all device applications, which is particularly essential for many M2M devices. Rubra A10393 is a high efficiency penta-band cellular SMD antenna suitable for GSM, GPRS and UMTS applications and covers the GSM850/900/1800/1900 and WCDMA frequencies. Rubra's MDA structure provides excellent resistance to de-tuning and offers predictable performance in customer devices. Rubra A10315 is a compact 40x10.4x3.2 mm size antenna intended for surface mounting and requires minimal ground plane. Made from low cost halogen-free FR4 substrate material.

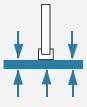
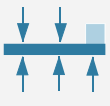
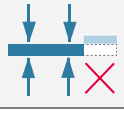
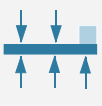
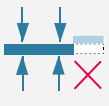
Clarki A10464 Standard Over-Module Cellular Antenna

Clarki A10464 cellular quad-band antenna extends the gigaNOVA® range of standard off-the-shelf antennas for M2M applications. Designed to be mounted over a corner of most commercially available M2M cellular modules, Clarki is the ideal choice for M2M module and integrated device manufacturers looking for a standard platform antenna to be used across a range of devices where space saving, tighter integration and predictable performance is required.

gigaNOVA® Antenna

Antenova M2M, the antennas for wireless M2M applications company, offers the gigaNOVA® range of market leading standard antenna solutions for 2.3 GHz, 2.4 GHz, 2.5 GHz, 5 GHz, GPS, GSM/CDMA, WCDMA and ISM900 bands. Designed for ease of integration into wireless devices, they are the smart choice for GPS, Bluetooth® (BT, BT EDR, BT LE), Wi-Fi®, ZigBee®, WiMAX™, WiBro, MIMO and cellular M2M applications.

		Cellular				WiMAX™ at 2.3 GHz & 2.5 GHz and WiBro							
		SMD			Pins		Swivel		SMD				
Product name		Calvus	Reflexus	Rubra	Clarki		Titanis	Picea	Mica	Comata	Rufa	Impexa	Fusca
Frequency		GSM850/900/1800/1900/WCDMA			GSM850/900/ 1800/1900		WiMAX at 2.3 GHz & 2.5 GHz & WiBro						
Part no	left	A10340	A10315	A10393	A10464		B4844	B5771	A5645	A6111	A5839	A6150	A10192
	right										A5887		
Dimensions [L x W x H] (mm)		28 x 8 x 3.2	40 x 10 x 3.2	40 x 10.4 x 3.2	26.1 x 26.1 x 10.15		20 x 19.5 x 62	14.9 x 12 x 48	20.5 x 3.6 x 3.3	12.8 x 3.6 x 3.3	12.8 x 3.9 x 1.1	6.1 x 3.9 x 1.1	4 x 3 x 1.1
VSWR		‹3:1	‹3:1	‹2.6:1	(L) 2.6:1								
					(R) 2.9:1								
Efficiency (typical)	824MHz-964MHz	66%	70%	75%	(L) 62%	WiMAX & WiBro 2.3 GHz	75%	70%	55%	45%	65%	55%	50%
					(R) 64%								
	1710MHz-2170MHz	69%	60%	65%	(L) 73%	WiMAX 2.5 GHz	70%	70%	55%	not available	55%	60%	55%
					(R) 64%								
Components & groundplane													

		Bluetooth® (BT, BT EDR, BT LE), Wi-Fi® and ZigBee®									ISM		
		Swivel		SMD								SMD	
Product name		Titanis	Picea	Mica	Comata	Mixtus	Rufa	Impexa	Fusca	Indica	Kirbii	Brevis	Cyaneus
Frequency		2.4 GHz	2.4 GHz	2.4 GHz	2.4 GHz	2.4 GHz/ 5 GHz	2.4 GHz	2.4 GHz	2.4 GHz	2.4 GHz	868MHz / 915MHz	1575 MHz	1575 MHz
Part no	left	B4844	B5771	A5645	A6111	A10194	A5839	A6150	A10192	A10381	A10472	A10204	A10137
	right						A5887						
Dimensions [L x W x H] (mm)		20 x 19.5 x 62	14.9 x 12 x 48	20.5 x 3.6 x 3.3	12.8 x 3.6 x 3.3	10 x 10 x 0.9	12.8 x 3.9 x 1.1	6.1 x 3.9 x 1.1	4 x 3 x 1.1	3.3 x 1.6 x 0.65	10 x 3 x 2	22 x 3 x 3	20.1 x 9 x 1.6
VSWR		‹1.6:1	‹1.7:1	‹1.8:1	‹2.3:1	‹1.4:1 / ‹1.8:1	‹1.8:1	‹1.9:1	‹2:1	‹1.6:1	‹1.2:1 / ‹2:1	‹1.4:1	‹1.4:1
Efficiency (typical)		80 %	70 %	65%	45%	79%	75%	65%	65%	70%	69%	50%	70%
						66%					60%		
Components & groundplane													
Comments		Also available with reverse thread, part no B4844-R Not for outdoor use	PCB thickness: 1.6mm Not for outdoor use				Also available in 4mm height variant						

Antenova M2M offers a full range of development support and RF testing to help reduce customisation, design costs and accelerate your time to market. Using their advanced measuring equipment, custom tuning and technical support ensures a secure and reliable implementation. Make Antenova M2M your partner of choice from new product development. To find out more, email **wireless@avnet-embedded.eu**

Antenova M2M's Radionova RF Antenna Module

		GPS RADIONOVA RF Antenna Modules					
		Connector	SMD	SMD	SMD	SMD	SMD
Product No.		**M10372**	**M10382**	**M10477**	**M10478-A1**	**M10478-A2**	**M10478-A3**
Architecture		Ant + RF + BB	Ant + RF + BB	Ant + RF + BB	Ant + RF + BB	Ant + RF + BB	Ant + RF + BB
GPS Chipset		SiRFstarIV GSD4e	ublox G6010-ST	SiRFstarIV GSD4e	SiRFstarIV GSD4e	MediaTek MTK3337	MediaTek MTK3333
Frequency		1575 MHz	1575 MHz	1575 MHz	1575 MHz	1575 MHz	1575-1609 MHz
Dimensions (mm)		28 x 13 x 5	24.2 x 9.9 x 3.9	24.2 x 9.9 x 3.8	13.8 x 9.5 x 1.8	13.8 x 9.5 x 1.8	13.8 x 9.5 x 1.8
Antenna Bandwidth		30 MHz	30 MHz	30 MHz	30 MHz	30 MHz	45 MHz
Omni-directional Antenna		Yes	Yes	Yes	Yes	Yes	Yes
Externat antenna support		Yes	Yes	Yes	Yes	Yes	Yes
Average antenna gain equivalent to ceramic antenna		~17 x 17 x 4	13 x 13 x 4	~17 x 17 x 4	~17 x 17 x 4	~17 x 17 x 4	~17 x 17 x 4
Power Consumption	**Acquisition**	40mA	50mA	40mA	40mA	31mA	38mA
	Tracking	40mA	40mA	31mA	31mA	24mA	28mA
	Sleep mode	40uA	25uA (Battery Backup)	20uA	20uA	‹200uA	‹350uA
Host Interface		UART / SPI / I2C CMOS 1.8V	UART / SPI / I2C / DDC / USB CMOS 1.8V/3.3V	UART / SPI /I2C CMOS 1.8V	UART / SPI /I2C CMOS 1.8V	UART CMOS	UART CMOS
Baud Rate (bps)		4800	9600	4800	4800	User Config.	User Config.
Data Output Protocol		NMEA 0183 / Binary	NMEA 0183 / UBX	NMEA 0183 / Binary	NMEA 0183 / Binary	NMEA 0183 / Binary	NMEA 0183 / Binary
Sensitivity	**Acquisition**	-148 dBm	-147 dBm	-147 dBm	-147 dBm	-148 dBm	-148 dBm
	Tracking	-163 dBm	-160 dBm	-163 dBm	-163 dBm	-165 dBm	-165 dBm
Typical Applications		Smart Watches Tracking Devices Portable AVL Medical / eHealth	Smart Watches Tracking Devices Portable AVL Medical / eHealth	Smart Watches Tracking Devices Portable AVL Medical / eHealth	Smart Watches Tracking Devices Portable AVL Medical / eHealth	Smart Watches Tracking Devices Portable AVL Medical / eHealth	Smart Watches Tracking Devices Portable AVL Medical / eHealth

Antenova M2M offers excellent technical support to ensure a secure and reliable implementation, which includes design guidelines, advanced measuring equipment and custom tuning. We highly recommend our customers to use our know-how when it comes to implementing the antenna and RF Antenna Modules.

WIRELESS LINECARD: OVERVIEW

This is an overview of all our key suppliers in the wireless segment. Please contact us for further information.

Note: Not all suppliers are available in all countries.

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Embedding success in your business.

AVNET EMBEDDED OFFICES.

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Fax: +27 21 686 4709
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